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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/663,692 | 09/17/2003 | Hiroshi Sugihara | 000298A | 5039 |
| 23850 | 7590 | 04/13/2004 | EXAMINER | |
| ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP 1725 K STREET, NW SUITE 1000 WASHINGTON, DC 20006 | | | PAK, SUNG H | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2874 | |

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/663,692 | Applicant(s) SUGIHARA, HIROSHI | |
| | Examiner Sung H. Pak | Art Unit 2874 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-69 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 31-49 and 52-69 is/are rejected.
- 7) ☒ Claim(s) 50 and 51 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 0903.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

Information Disclosure Statement

All references cited in the information disclosure statement filed 9/17/2003 have been considered. Please refer to the initialed copy of PTO-1449 enclosed herewith.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 31-33, 35, 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Gross et al (US 6,310,352 B1).

Gross et al reference discloses an optical device with all the limitations set forth in the claims, including: a radiation detecting system comprising an optical fiber cable adapted to emit light at a region where radiation is applied and transmitting the emitted light (abstract); photoelectric conversion means connected to at least one end of the optical fiber cable (column 3 lines 40-56); processing means, such as a computer, detecting when radiation is applied in accordance with an output signal of the photoelectric conversion means (column 3 lines 40-56); the radiation system including analog to digital conversion means, such as a computer (column 3 lines 40-56); wherein the photoelectric mean includes an optical fiber cable coupled to one input terminal (column 3 lines 40-56); wherein one end of the optical fiber is opened to the testing specimen (Fig. 6); the optical fiber cable including at least one detect portion, wherein the light

emitted at the detect portion, when radiation is applied to the detect portion, is transmitted within the optical fiber cable (Fig. 5).

Claims 31, 33-34, 36-37 are rejected under 35 U.S.C. 102(b) as being anticipated by Maekawa (US 5,629,515).

Maekawa reference discloses an optical device with all the limitations set forth in the claims, including: a radiation detecting system comprising an optical fiber cable adapted to emit light at a region where radiation is applied and transmitting the emitted light (abstract); photoelectric conversion means connected to at least one end of the optical fiber cable (Fig. 2); processing means detecting when radiation is applied in accordance with an output signal of the photoelectric conversion means (Fig. 2); wherein the photoelectric conversion means includes one input terminal to which one end of the optical fiber cable is connected, and wherein the optical fiber cable further includes a reflection means at another end of the optical fiber cable (Fig. 4); wherein the photoelectric conversion means includes two input terminals to which both ends of the optical fiber cable are respectively connected (Fig. 15); the optical fiber cable including at least one detect portion, wherein the light emitted at the detect portion, when radiation is applied to the detect portion, is transmitted within the optical fiber cable (Fig. 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 38-49, 52-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gross et al (US 6,310,352) in view of Da Silva et al (US 5,912,945).

Gross et al reference discloses an optical device with all the limitations set forth in the claims as discussed above, except it does not teach the use of a radiation-shielding layer having a gap therein as a radiation detection portion. Specifically, Gross et al reference discloses an optical transmission core ("1" Fig. 1) and a clad layer ("2" Fig. 1) wherein the clad layer having scintillator material dispersed therein (column 6 line 62- column 7 line 15); outer reinforcing jacket layer ("2a" Fig. 2); inorganic scintillator material doped in the cladding layer (column 6 lines 33-38); wherein the radiation is selected from the group consisting of x-ray, γ -ray, etc. (abstract); wherein the cladding may be a synthetic resin (column 6 lines 62-64).

Da Silva et al reference, on the other hand, explicitly teaches the use of a radiation-shielding layer having a gap therein as a radiation detection portion (Figs. 5-7). Such feature is advantageous and desirable over the prior art because it allows for determination of directional orientation of the radiation source. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Gross et al device to have a radiation-shielding layer comprising a gap.

Regarding claims 41-42, 44-45, 47, 49, the claims are obvious over Gross et al in view of Da Silva et al as discussed above, except the references do not explicitly discuss the use of bunch of reinforcing fibers and winding tapes. However, reinforcing fibers and winding tapes are well

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known in the fiber optic cables art. Reinforcing fibers and winding tapes are advantageously used to give mechanical strength to otherwise flexible optical fibers. The added mechanical strength is advantageous and desirable for limiting sharp bends, and limiting undesirable bending loss. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Gross et al device in view of Da Silva to have reinforcing fibers and winding tapes.

Allowable Subject Matter

Claims 50-51 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

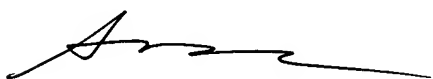
The following is a statement of reasons for the indication of allowable subject matter: As discussed in the office action, a radiation detection system comprising fiber optic cables and radiation shielding layers is known in the prior art. However, none of the prior art fairly teaches or suggests such a radiation detection system having a fiber optic cable with circumferential gap formed on the radiation shielding layer, as recited in the claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (571) 272-2353. The examiner can normally be reached on Monday - Thursday : 6:30am- 5:00pm.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sung H. Pak
Examiner
Art Unit 2874

sp



Brian Healy
Primary Examiner